

Validation of an Asthma Knowledge Questionnaire for Use With Parents or Guardians of Children With Asthma

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OBJECTIVE: Interventions to increase asthma knowledge enable children and/or their parents to acquire skills needed for the prevention and/or appropriate management of crises. Periods of illness caused by the disease can thereby be reduced. However, no validated instrument for quantifying knowledge of asthma is available in Spanish. The aim of the present study was to develop and validate an asthma knowledge questionnaire that could be self-administered by parents and/or persons charged with caring for asthmatic children.

MATERIAL AND METHODS: The 17 items that make up the questionnaire were obtained on the basis of a review of the literature, focus group discussions, the professional experience of the researchers, and pilot studies. We evaluated the instrument's face, content, and concurrent validity and analyzed its factorial structure. The test-retest reliability of the questionnaire and its sensitivity to change were also assessed.

RESULTS: A total of 120 pediatric patients with a mean (SD) age of 4.5 (3.7) years participated. Factor analysis demonstrated a probable structure of 3 factors that together explained 85% of the total variance in results. The opinion of an interdisciplinary group of experts on asthma confirmed the face validity of the instrument. The questionnaire's ability to distinguish between parents with high and low asthma knowledge demonstrated its concurrent validity. Test-retest reliability was demonstrated, as was sensitivity to change between 2 different testing moments.

CONCLUSIONS: The asthma knowledge questionnaire developed is useful and reliable for quantifying the baseline level of asthma knowledge of parents of asthmatic children as well as to assess the efficacy of an educational intervention aiming to increase knowledge and understanding of the disease.

Key words: *Asthma. Asthma knowledge. Questionnaire. Validation.*

Validación de un cuestionario de conocimientos acerca del asma entre padres o tutores de niños asmáticos

OBJETIVO: Una intervención educativa destinada a aumentar el conocimiento acerca del asma permite a los niños y/o sus padres adquirir habilidades que les permitan prevenir y/o manejar adecuadamente las crisis asmáticas, disminuyendo la morbilidad producida por la enfermedad. Sin embargo, en nuestro medio no contamos con un instrumento validado que nos permita cuantificar el nivel de conocimiento de asma. El objetivo del presente estudio ha sido desarrollar y validar un cuestionario de conocimientos acerca del asma para ser cumplimentado por los padres y/o personas encargadas del cuidado de pacientes pediátricos asmáticos.

MATERIAL Y MÉTODOS: Los 17 ítems que conforman el cuestionario se obtuvieron de la revisión de la bibliografía, la realización de grupos focales, la experiencia profesional de los investigadores y la realización de pruebas piloto. Se evaluó la validez de apariencia, de contenido y de criterio concurrente del instrumento; asimismo se determinaron la estructura factorial, la fiabilidad test-retest y la sensibilidad al cambio del cuestionario.

RESULTADOS: Se incluyó a 120 pacientes pediátricos con una edad promedio (\pm desviación estándar) de 4,5 \pm 3,7 años. El análisis factorial demostró una estructura probable de 3 factores, que en conjunto explican el 85% de la varianza total de los resultados. La validez de apariencia y de contenido se basó en el concepto de un grupo multidisciplinario de expertos en el tema. La validez de criterio concurrente se demostró mediante la habilidad del cuestionario para distinguir a los padres con alto y con bajo conocimiento acerca del asma. Se demostraron además una adecuada fiabilidad test-retest y una adecuada sensibilidad al cambio al comparar la puntuación del cuestionario administrado en 2 ocasiones distintas.

CONCLUSIONES: El cuestionario de conocimientos de asma desarrollado en el estudio es una herramienta útil y fiable para cuantificar el nivel basal de conocimiento acerca del asma en padres de niños asmáticos, así como para determinar la eficacia de una intervención educativa destinada a aumentar el conocimiento y la comprensión de la enfermedad.

Palabras clave: *Asma. Conocimiento en asma. Cuestionario. Validación.*

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Introduction

Children and/or their parents need a basic understanding of the pathophysiology of asthma and its treatment if they are to acquire the skills to manage the

disease independently—for such understanding has been associated with better disease control.¹⁻³ This is the case because the main factors implicated in illness due to asthma,⁴ namely underlying treatment with anti-inflammatory drugs, overconfidence in the use of bronchodilators, and delay in seeking medical help during an asthmatic crisis, can in fact be modified if disease awareness is raised. For this reason, increasing knowledge is a common objective of educational programs for asthma self management.⁵

An educational intervention that seeks to increase knowledge of asthma should allow children and/or their parents to understand the nature of the disease and the factors that can cause an attack. It should also provide information on adequate monitoring of disease status, on medications and on how they should be used in case a crisis develops. This is to say, it must promote the acquisition of skills that let children and/or parents prevent or adequately manage an asthma attack.^{6,7}

However, a validated, reliable instrument that is sensitive to change in knowledge of asthma is needed before such change can be attributed to an educational intervention rather than be considered an artifact of measurement error.⁸ In spite of the importance of having an instrument with the aforementioned psychometric properties, none has been available for our Spanish language clinical setting.

The aim of this study was to develop and validate such questionnaire an asthma knowledge to be self-administered by parents and/or guardians of pediatric patients with asthma.

Material and Methods

Questionnaire

Items on the questionnaire developed for this study were derived from 3 sources: the literature,⁹⁻¹³ responses and comments made by parents of asthmatic children during focus groups, and the professional experience of the researchers. Face and content validity were assessed by an interdisciplinary group with extensive experience in treating asthmatic children: 4 pediatric pneumologists, a physical therapist, a nurse supervisor, and a clinical psychologist. Each member of the team was asked to evaluate the questionnaire by assigning to each item a number from 0 to 2, 0 indicating the item had no importance and 2 indicating it had great importance and needed to be kept on the final instrument. Later, each item's average score was calculated and items were ranked. Those with the lowest scores were considered candidates for removal.

Next the questionnaire was piloted in 4 groups of parents of asthmatic children. Each group consisted of the parents of 10 to 15 asthmatic children; the population was a convenience sample enrolled sequentially in a single facility where the study was carried out so that subjects would have a similar educational and cultural level. The pilot studies evaluated item comprehension and ambiguity, the presence of questions with affective loading, response frequency, range of

responses, and time needed to complete the questionnaire.^{8,14} Items with responses in a certain direction more than 95% of the time were considered candidates for removal. Items were added, modified, or removed based on information collected until the final questionnaire had the 17 items shown in Table 1. The parents responded to each item on a Likert-type scale of 5 points with answers ranging from "strongly disagree" to "strongly agree." Responses to each item were thus graded from 1 to 5 and greater weight was assigned to correct answers. That is, if a true statement obtained a correct response of "strongly agree," a score of 5 was assigned. Scoring gradually decreased until a score of 1 was reached when that item received a response of "strongly disagree." In the same way, if an affirmation that was false received a response of "strongly disagree" a score of 5 was assigned. Scoring gradually decreased until only 1 point was given for a response of "strongly agree." Item scores were then added for a total score ranging from 17 to 85, with higher scores indicating greater knowledge of asthma.

Data recorded in addition to asthma knowledge were age, sex, time since diagnosis, and parents' educational level.

TABLE 1
Asthma Knowledge Questionnaire

1. Inhaler use can lead to dependence or addiction.
2. Inhalers can have an affect on the heart or damage it.
3. It's not good for children to use the inhaler for too long.
4. After a child's asthma attack, once the coughing is over, use of the inhaler and medications should stop.
5. Children with asthma should use asthma medications only when they have symptoms (coughing, congestion, or wheezing).
6. It's better to use inhalers directly, without a holding chamber, so the medication can go more directly to the lungs.
7. The main cause of asthma is airway inflammation.
8. Parents should ask a doctor to tell the school that an asthmatic child shouldn't exercise or participate in physical education classes.
9. Children who have asthma shouldn't participate in sports that make them run too much.
10. When a child has an asthma attack it's best to go to the emergency room even if symptoms are mild.
11. Asthma attacks can be prevented if medications are taken even when there are no symptoms—between attacks.
12. Flu infections are the main causes or triggers of asthma attacks.
13. It's best not to smoke or let anyone else smoke near a child who has asthma.
14. If the parents of a child with asthma smoke outside the house, it won't affect the child.
15. If an asthmatic child gets the flu, you should apply the inhalers even if there's no coughing or wheezing.
16. Asthmatic children might have attacks that are severe enough to require hospitalization in an intensive care unit or they might even die from an attack.
17. Some medications for asthma don't work unless they're administered every day.

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